CLAIMS

We claim:

1. A composition comprising

$D\text{-}Si(Y)_3$

wherein D represents

X-, X-Z-, V-, V-Z-, W, or W-Z-,

wherein X is a compound of interest, Z is a linking group, V is a leaving group, and W is a reactive group,

wherein each Y is independently a capture tag or substituted or unsubstituted $C_{1\text{-}20}$ straight, branched or cyclic alkyl, aralkyl, aryl, alkaryl, alkenyl, alkynyl, alkoxy, alkenyloxy, alkynyloxy, heteroalkyl, heterocyclic, alkyl-heterocyclic, or heterocyclic-alkyl,

wherein at least one Y is a capture tag,

wherein substituents are independently hydroxy, thio, amine, ether, thioether, keto, carboxy, alkenyl, alkynyl, phosphorus derivatives, or carbonyl.

2. The composition of claim 1 wherein each capture tag is independently selected from the group consisting of lipophilic residues, antibodies, haptens, ligands, and thiol containing residues.

3. The composition of claim 1 wherein the capture tag is a lipophilic residue.

4. The composition of claim 1 wherein the capture tag is an antibody.

5. The composition of claim 1 wherein the capture tag is a biotin or a derivatized biotin molecule.

6. The composition of claim 1 wherein the capture tag is a thiol containing molecule.

7. The composition of claim 1 wherein V is selected from the group consisting of iodide, bromide, chloride, tosylate, nosylate, mesylate, triflate, brosylate, and acetate.

8. The composition of claim 7 wherein V is Cl.

9. The composition of claim 1 wherein W is an activatable phosphorus moiety.

10. The composition of claim 9 wherein the activatable phosphorus moiety is $P(OR^6)(NR^4R^5)$, $P(R^7)(NR^4R^5)$, $P(H)(O)(O^-)$, or $P(O)(O^-)(OR^6)$,

wherein R^4 and R^5 are alkyl groups which may be the same or different, or which together form part of a ring structure, R^6 is a standard phosphate protecting group, R^7 is substituted or unsubstituted straight of branched chain alkyl, aryl or aralkyl.

11. The composition of claim 1 wherein Z is

-B-L-B-

wherein each B is independently O, S, or NH,

wherein L is substituted or unsubstituted $C_{1\text{-}20}$ straight, branched or cyclic alkyl, aralkyl, aryl, alkaryl, alkenyl, alkynyl, alkoxy, alkenyloxy, alkynyloxy, heteroalkyl, heterocyclic, alkyl-heterocyclic, or heterocyclic-alkyl,

wherein substituents are independently hydroxy, thio, amine, ether, thioether, keto, carboxy, alkenyl, alkynyl, phosphorus derivatives, or carbonyl,

wherein one or more of the carbons can be independently replaced by O, S, or NH.

12. The composition of claim 11 wherein the Y moieties are tocopheryl, isopropyl and isopropyl; L is hexan-1,6-diyl; each B is O; and W is $P(OCH_2CH_2CN)N(Pr^i)_2$.

13. The composition of claim 11 wherein the Y moieties are cholesteryl, isopropyl and isopropyl; L is hexan-1,6-diyl; each B is O, and W is $P(OCH_2CH_2CN)N(Pr^i)_2$.

14. The composition of claim 1 wherein the compound of interest is an oligomer.

15. The composition of claim 14 wherein the oligomer is an oligonucleotide.

16. The composition of claim 15 wherein the oligonucleotide includes at least one nucleotide residue that is not a deoxyribonucleotide residue.

17. The composition of claim 15 wherein the oligonucleotide includes at least one ribonucleotide residue.

18. The composition of claim 15 wherein the oligonucleotide includes at least one ribonucleotide analogue residue.

19. A method of purifying a compound, the method comprising

coupling the compound to a composition according to claim 1, wherein D represents V-, V-Z-, W, or W-Z-, and

separating the coupled compound from contaminating compounds by interacting the capture tag with a capture tag receptor.

20. The method of claim 19 wherein the compound is an oligomer.

21. The method of 20 wherein the oligomer is an oligonucleotide.

22. The method of claim 21 wherein the oligonucleotide includes at least one deoxyribonucleotide residue.

23. The method of claim 21 wherein the oligonucleotide includes at least one ribonucleotide residue.

24. The method of claim 21 wherein the oligonucleotide includes at least one ribonucleotide analogue residue.

25. The method of claim 15 wherein the capture tag is a lipophilic residue.

26. The method of claim 15 wherein the capture tag is an antibody.

27. The method of claim 15 wherein the capture tag is a biotin or a derivatized biotin molecule.

28. The method of claim 15 wherein the capture tag is a thiol containing molecule.

29. The method of claim 15 wherein the capture tag is a lipophilic residue, and wherein separating the coupled compound from contaminating compounds is accomplished by reversed phase chromatography.

30. A method for purifying an oligomer from failure sequences in oligomer synthesis, the method comprising

using a compound of claim 1 as a terminal modifier in oligomer synthesis, wherein D represents V-, V-Z-, W, or W-Z-, and

separating the terminally modified oligomer from the failure sequences by interacting the capture tag with a capture tag receptor.